
NAVY PUBLIC WORKS CENTER
NORFOLK, VIRGINIA
UTILITIES DEPARTMENT

STANDARD OPERATING PROCEDURE / JOB HAZARD ANALYSIS

TITLE

REPAIR 11.5/4.16 KV OIL CIRCUIT BREAKER

PROCEDURE NUMBER

WC 624 HVE 090

SIGNED:_____

(DATE)

APPROVED:_____

(DATE)

SAFETY PROFESSIONAL:_____

(DATE)

MANAGEMENT OFFICIAL:_____

(DATE)

REVISION A

DISTRIBUTION

CODE	REV/DATE	REV/DATE	REV/DATE	REV/DATE	REV/DATE	REV/DATE	REV/DATE
601.C3							
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610.E1							
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REVISIONS

REV	DESCRIPTION	SIGNATURE	DATE
A	Initial Issue.		

REPAIR 11.5/4.16 KV OIL CIRCUIT BREAKER

Purpose:
Procedure to repair an 11.5/4.16 kv, drawout, oil, circuit breaker.

Potential Energy Sources:
1. Primary cables.
2. Primary bus.

Tools and PPE:
Tools: Hand tools. PPE: Safety shoes, work gloves, safety glasses, insulating rubber gloves, hard hat, Nomex coveralls, and back brace if required by back injury prevention and control program.

References:
1. PWC Occupational Safety and Health Program Manual, PWCNORVAINST 5100.33E
2. Occupational Safety and Health Standards for General Industry (29 CFR PART 1910): Subpart I, Personnel Protective Equipment; Subpart R, Electrical Power Generation / Transmission / Distribution; Subpart S, Electrical
3. NFPA 70 E approach distances to exposed, energized, electrical conductors and circuit parts.
4. SOP WC 622 HVE 013, Hazardous Energy Control(Lockout, Tagout)
5. SOP WC 622 HVE 007, Switchout And Switchback Energized Circuit
6. Individual Breaker Manufacture's Instruction Book

Procedures:
1. WC 622 will deenergize the oil circuit breaker and rack the breaker down off it's stabs. WC 622 will follow SOPs

WC 622 HVE 007, Switchout And Switchback Energized Circuit
WC 622 HVE 013, Hazardous Energy Control(Lockout, Tagout)

2. The required PPE for the repair work will be work gloves, safety shoes, safety glasses, and safety goggles when working with oil or a cleaning solvent.

3. Remove the breaker from the cubicle.
   a) Roll breaker cart in place and secure to the cabinet.
   b) Rack breaker onto the cart and lock down.
   c) Release the cart lock and roll breaker away from the cubicle.
   d) Close the cubicle door and place a lock on the door to prevent entry into cube while breaker is away. There is no need to place a tag on the cubicle door.

4. Problem with operating mechanism.
   a) If the problem is not known then inspect and troubleshoot the mechanism to determine what the trouble is.
   b) Repair the problem. If parts are required, record part information in order to purchase the part. Make the necessary repairs once the

replacement part(s) arrive.

5. Problem inside the oil tank.
   a) Drain oil into clean dry drums for storage during repair work.
   b) If the problem is not known then inspect and troubleshoot the breaker's contacts, insulators, and operating mechanism parts to determine what the trouble is.
   c) Repair the problem. If parts are required, record part information in order to purchase the part. Make the necessary repairs once the replacement part(s) arrive.
   d) Once repairs are complete, clean and replace the oil tank and it's gasket.
   e) Inspect oil and take a sample for a dielectric test.
      .if oil is visually bad(black or dark brown, sludge present) replace the oil(see (e) below).
      .old oil should test to 25 kv, filter if not at this value
      .replace oil if can not filter to 25 kv
   f) If replacing oil, test the oil prior to adding. The oil should test at 30 kv. If the oil tests below 30 kv obtain another batch, or filter till the oil tests at 30 kv. To add oil and not introduce air into the fluid
      i) Connect pump/filter and hose assembly to device's bottom drain valve.
      ii) Turn pump on and open the device's drain valve's test port. Pump oil into a container till no air bubbles are present in the oil stream. At this point close the test port; open the drain valve and fill the tank to the proper level.
      iii) If possible fill with a vacuum in the tank.
   g) Settling time - If air has been introduced into the switch's insulating oil by (a) not following the pumping procedure, (b) air bubbles in the oil stream, (c) air pumped into oil due to emptying the new oil container, (d) oil has been through a filter operation, then the breaker will have to have a settling time of 8 hours. The settling time can be reduced to 1 hour by placing a vacuum in the oil tank. Do not exceed the tank's pressure strength. If this is not known then a 5 psig vacuum should be used.

6. Place breaker back in cubicle.
   a) Remove the lock placed on the door to prevent entry into cube while breaker was away and open the door.
   b) Roll breaker cart in place and secure to the cabinet.
   b) Unlock the breaker and rack it into the cube, but not in connected(racked completely into stabs) position.
   c) Release the cart lock and roll it away from the cubicle

7. WC 622 will rack the break back up into it's stabs and then will reenergize the device per SOPs

WC 622 HVE 013, Hazardous Energy Control(Lockout, Tagout)

END